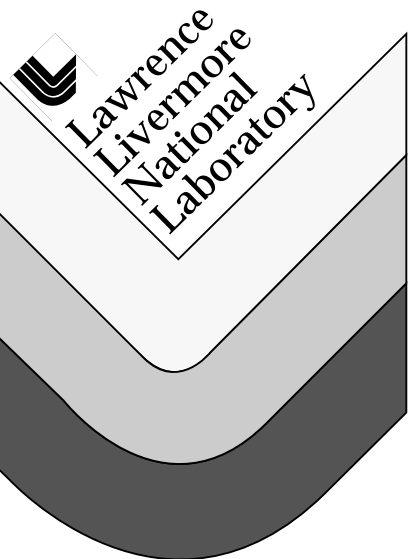


Laser Programs Facility Management Plan for Environment, Safety, and Health

G. E. Cruz

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Laser Programs Facility Management Plan for Environment, Safety, and Health

Approved by:

E. Michael Campbell
Associate Director
Laser Programs

LAWRENCE LIVERMORE NATIONAL LABORATORY
University of California/Livermore, California

Laser Programs Facility Management Plan for Environment, Safety, and Health

A. Policy Statement

The Laser Programs basic environment, safety, and health (ES&H) policy is: to take every reasonable precaution in the performance of its work to protect the health and safety of employees and the public; to minimize the possibility of damage to property and the environment. The responsibility for safety resides with the Associate Director (AD) for Laser Programs and is delegated through line management to each employee. The Hazards Control, Health Services, and Environmental Protection Departments support the Programs with technical services and professional safety expertise.

This Facility Management Plan (FMP) provides the basis for the rules and practices that are necessary for efficient and safe conduct of operations in the Laser Programs Complex. Everyone who enters this complex, in whatever capacity, is expected to abide by the applicable requirements of this Plan. All employees are expected to protect themselves and others from injury. Regular occupants of the complex are expected to guide and govern visitors and to assist new or temporary occupants in understanding and obeying applicable requirements.

B. Review and Approval Authority

B.1 Review

This FMP shall be formally reviewed annually by the Laser Programs Safety Officer and at least triennially by the AD for Laser Programs to ensure that its contents are appropriate and adequate for current operations. If changes are necessary before the triennial review date, the FMP will be amended and the changes approved by the Associate Director for Laser Programs.

The Facility Management Plan was prepared by:

G. E. Cruz	Safety Officer, Laser Programs
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The Facility Management Plan has been reviewed by:

E. V. George	Principal Deputy Associate Director, Laser Programs
R. M. Feinberg	Deputy Associate Director, Laser Programs
W. E. Krupke	Deputy Associate Director, Laser Programs
C. W. Hatcher	Assurances Manager, Laser Programs
M. G. Trent	Hazards Control ES&H Team Leader
H. T. Powell	Laser Science and Technology Program
J. D. Kilkenny	Target Physics Program
J. A. Paisner	National Ignition Facility Project Manager
J. T. Early	Isotope Separation and Advanced Manufacturing Program
R. E. Twoood	Imaging and Detection Program
N. M. Ceglio	Microtechnology Program
L. Chandler	Assessment Officer, Laser Programs
K. H. Nakamura	Operations Manager, Laser Programs

B.2 Approval

This FMP has been approved by:

E. Michael Campbell Associate Director, Laser Programs

C. Introduction

C.1 General Information

The Lawrence Livermore National Laboratory's (LLNL) Laser Programs ES&H policy is established by the Associate Director for Laser Programs. This FMP is one component of that policy.

Laser Programs personnel design, construct and operate research and development equipment located in various Livermore and Site 300 buildings (see Appendix A). The Programs include a variety of activities, primarily laser research and development, inertial confinement fusion, isotope separation, and an increasing emphasis on materials processing, imaging systems, and signal analysis.

This FMP is a formal statement of responsibilities and controls to assure operational activities are conducted without harm to employees, the general public, or the environment. This plan identifies the hazards associated with operating a large research and development facility and is a vehicle to control and mitigate those hazards. Hazards include, but are not limited to: laser beams, hazardous and radioactive materials, criticality, ionizing radiation or x rays, high-voltage electrical equipment, chemicals, and powered machinery.

C.2 Changes

Proposed changes in operations that are outside of the scope of this FMP will be reviewed and approved as described in Section D prior to initiating changes.

D. Responsibility and Authority

D.1 Associate Director

The AD for Laser Programs is responsible for the conduct of all activities within Laser Programs. Through Program Leaders (PLs), he or she provides management direction to those people responsible for individual tasks. Through the Assurances Office, he or she monitors activities to assure that they are conducted in accordance with LLNL ES&H policies and procedures. This program is in conformance with the environment, safety and health program at Lawrence Livermore National Laboratory, UCRL-AR-119618 Rev. 0.

The AD approves this FMP, all Facility Safety Procedures (FSPs), and all Level A Operational Safety Procedures (OSPs) that involve a high level of risk as defined in Appendix 2-D (Level A) of the LLNL *Health & Safety Manual*. The AD approves all program-wide activity plans, such as quality assurance and self-assessment plans.

D.2 Program Leader (PL)

D.2.1 Program

The Program Leader of a specific program has cognizance over all activities within that program. Through the Associate Program Leaders (APLs) and other line managers, he or she provides direction to Lead Experimenters (LEs) and Responsible Individuals (RIs) regarding the goals and requirements of their activities. The PL allocates resources within his or her program to assure that both program and ES&H goals and requirements are met.

PLs, or their designee approve all Level B OSPs as defined in Appendix 2-D of the LLNL *Health & Safety Manual*.

D.2.2 Assurances

The Assurance Manager for Laser Programs provides support to program management to assist them in maintaining safe, healthy, and environmentally sound working conditions. This includes:

- preparation of program-wide ES&H plans;
- assisting program staff in setting up activities that support those plans;
- reviewing all program ES&H procedures;
- monitoring program activities to assure that they are in compliance with program and Laboratory requirements; and
- providing an interface between the programs and external ES&H organizations.

D.2.3 Operations

The Manager for Laser Programs Operations provides, among other services, facilities support to program activities. Operations serves as a point of contact between the programs and Plant Engineering Department to maintain and modify those facilities as required to meet programmatic and ES&H requirements.

D.3 Lead Experimenters and Responsible Individuals

The LEs and RIs are those people who have been given responsibility for a specific laboratory, shop, or activity within Laser Programs. They shall assure that:

- all activities within their area are conducted in accordance with applicable OSPs, FSPs, and Laboratory policy;
- all personnel working in their area have the necessary training, experience, and equipment to perform their jobs safely;
- work areas are maintained in a safe, orderly, and organized manner; and,
- the documentation needed to achieve and verify these goals and requirements are maintained in a readily retrievable manner.

D.4 Individuals

Each individual working within Laser Programs is responsible for maintaining safe, healthy, and environmentally sound working conditions in their area. No individual is to undertake any activity that involves a significant risk to themselves, their coworkers, Laboratory facilities, the public, or the environment. If individuals have any question regarding their responsibilities while conducting their work, they should check with their supervisor, other line management, EPD Analyst, or Hazards Control staff, before starting. Each individual has the responsibility to stop high-risk activities under his or her supervision. Each individual also has the responsibility to ask management, EPD, or Hazards Control to stop a high-risk activity in any area of Laser Programs.

D.5 ES&H Support Departments

The Hazards Control, Environmental Protection, and Health Services Departments are responsible for providing expertise, guidance, and services to Laser Programs in the areas of environment, safety, and health. In Laser Programs, Hazards Control ES&H Team 2 coordinates safety, environment, and health services. ES&H Team 2 is composed of a staff of environmental and safety disciplines, health and safety technicians, a team leader, deputy team leader, and administrative staff.

Environment, safety, and health disciplines are assigned to various portions of Laser Programs as required. They advise experimenters and other personnel on safety, health, and environmental issues in the workplace. Discipline activities include:

- safety and environmental inspections;
- evaluating new experiments and procedures;
- reviewing designs for facilities and equipment;
- preparing NEPA documentation;
- reviewing and contributing to safety and environmental assessments;
- designing programs for, and reviewing the results of, personnel and facility monitoring programs;
- evaluating lessons to be learned from accidents, incidents, and occupational-related illnesses;
- assisting with air- and water-discharge permitting;
- packaging and preparing requisition for hazardous waste;
- assisting with emergency response to accidents, fires, spills, and other incidents;
- provide training; and
- through input to OSPs and FSPs, establishing special controls needed to address special safety issues not covered by the LLNL *Health & Safety Manual* and the *Environmental Compliance Manual*.

Environment, safety, and health disciplines attached to ES&H Team 2 are professionals in the fields of:

<u>Discipline</u>	<u>Field of Knowledge</u>
• Health Physics	Ionizing radiation
• Industrial Hygiene	Chemical safety, non-ionizing radiation, heat stress, noise and sanitation
• Fire Protection	Fire safety engineering
• Explosive Safety	Explosives safety
• Criticality Safety	Fissile material safety
• Industrial Safety	Lasers, electrical, pressure, construction
• EPD Analyst	Environmental compliance

These disciplines are supported by analytical laboratories, instrument calibration, radiation and chemical dosimetry, respirator services, and filter testing services.

The Emergency Management Division (Fire Department) of Hazards Control provides life-saving and fire-fighting services to all of LLNL. The Division also performs building fire inspections and sprinkler testing, and issues on-site burn permits.

Health and Safety Technicians are assigned to field locations throughout Laser Programs. Under the direction of a technician supervisor, they perform day-to-day activities necessary to support the safety program. They will assist program personnel in such activities as:

- monitoring for ionizing radiation, sound, environmental releases and chemicals;
- checking for oxygen deficiency and toxic gas during confined space entry;
- controlling roof access;
- emergency response;
- safety tours;
- assisting with disposal of hazardous waste;
- maintenance of safety equipment; and
- inspections.

Telephone numbers for technicians are posted throughout their areas of responsibility, or they can be reached through the ES&H Team 2 office (2-6126).

The ES&H Team 2 administrative staff directs the efforts of the disciplines and health and safety technicians and acts as an information conduit for program support requests. In addition, the team staff coordinates the review and production of OSPs and FSPs and distributes and collects design review packages. The team leader is also charged with recommending the level of Hazards Control and Environmental Protection support needed by Laser Programs.

D.6 Plant Engineering Department

Plant Engineering Department is responsible for inspection and maintenance of facility systems that have been designated as being vital to the protection of people, equipment, programmatic activity, or the environment. Such systems include:

- fire detection and alarm systems;
- automatic fire suppression systems;
- battery-powered emergency lights;
- evacuation paging systems;
- standby generators and uninterruptable power;
- building equipment alarms; and
- ventilation systems.

D.7 Oversight and Review Organizations

Numerous organizations outside of Laser Programs have oversight and review responsibilities within the Programs. These include individuals from LLNL, DOE/OAK, DOE/HQ, the University of California, and the State of California. These people must be given access to accomplish their duties. They may have unescorted access if they have met all the ES&H and security requirements for unescorted access. If they have not met all of those requirements, then the Programs must provide escorts in accordance with established LLNL procedures.

E. Mitigation and Control of Hazards

Hazards in Laser Programs facilities include:

- high-power lasers;
- high-voltage electrical equipment;
- ionizing radiation from radioactive materials, x-ray-producing equipment, ultra-short laser devices, fusion devices, and accelerators;
- hazardous and flammable chemicals;
- vacuum pressure vessels;
- magnetic fields; and
- material movement.

These hazards are evaluated through Facility Preliminary Hazards Analysis (PHAs) and Safety Analysis Reports (SARs). Hazards are controlled through procedures set forth in the LLNL Health and Safety Manual, which are documented at the worker level in FSPs and OSPs.

F. Training Program

Required job-related training activities shall be managed as integral components of the Laser Programs. Job training in the Laser Programs shall be defined and the activities shall be established and implemented to provide all personnel with the necessary skills and knowledge to accomplish their assigned tasks safely and competently. Required job training provided to Laser Programs personnel shall be documented. This applies to any person engaged in a Laser Programs supervised activity.

Laser Programs management considers that qualifications and training of individuals performing potentially hazardous assignments to have primary importance. The *Laser*

Programs Training Plan establishes the policies and assigns responsibilities for the management and conduct of training activities in the directorate. This training plan is consistent with LLNL policies and procedures. This plan applies to the research, technology development, and deployment activities of all programmatic elements under the direction of the Associate Director for Laser Programs, as well as all visitors and personnel who support operations within the programs.

G. Emergency Response

The philosophy of emergency preparedness at LLNL relies upon the use of the individual on-site organizations' capabilities and resources to protect the welfare of the employees. It is based upon the realization that during a major disaster, outside help may not be immediately available.

As a direct result of this philosophy, a Self-Help Program was implemented at LLNL. The two documents that describe emergency preparedness and self-help in the Laser Programs are: *Emergency Preparedness and Response Plan for Laser Programs*, and *Disaster Preparedness Plan for Individuals*. These two documents serve to integrate Laser Programs actions with the overall *LLNL Emergency Plan*. The approach of the Programs is to provide a flexible plan of action to ensure that: (1) emergency first aid is provided to injured personnel; (2) that the safety of others, both on- and off-site, is ensured; and (3) additional damage to facilities is minimized.

Everyone who enters the complex, in whatever capacity, is required to follow the applicable guidance and procedures as outlined in the emergency preparedness documents. Regular occupants are expected to guide and govern visitors and to assist new or temporary occupants in complying with the guidance provided in the Laser Programs emergency preparedness documents.

H. References

LLNL Health & Safety Manual, Health and Safety Division, Hazards Control Department, M-010.

Environmental Compliance Manual (UCRL-MA-118090), Environmental Protection Department.

Laser Programs Training Plan (L-12666), Laser Programs Assurances Office, Laser Programs.

Emergency Preparedness and Response Plan for Laser Programs (L-15409), Laser Programs Assurances Office, Laser Programs.

Disaster Preparedness Plan for Individuals (L-15437), Laser Programs Assurances Office, Laser Programs.

LLNL Emergency Preparedness Plan, Emergency Preparedness and Response Program.

Appendix A

Laser Programs Facilities

Building Number	Facility Name	Program Occupants
005	Graham Court	ICF/PE/WE
160	Cavatron Building	ISAM
162	Research/Crystal Growth	ICF/NAI
164	Preparation/Lasers	ICF
165	O.P.R.L	ICF
165A	165 Annex	
166	Development Lab	ISAM/ICF/EP/NAI
168	Research	ICF/NAI
169	Development Lab	ICF/EE
169	Block House	ICF/EE
169A	Paint Booth	ICF/EE
169B	Saw Shop	ICF/EE
169C	Saw Shop	ICF/EE
171	Development Lab	ICF/AMP/P&ST
174	Research	ICF/P&ST/CHEM
175	Mars Facility	ISAM
176	Machine Shop	ICF
177	Development Lab	ISAM
179	Development Lab	AMP
272	E/O Development Lab	I&DP/EP
OS273	Line of Site Vault	ISAM
298	Fusion Target	ICF/NAI
335	Support Facility	ISAM/DSED
381	Office/Research	ICF/OPS
382	Research	ICF
383	Machine Shop	MMED
391	Nova	ICF/AMP
392	Maintenance Shop	ICF
394	Chemical Storage	ICF
423	ARC	I&DP/ICF
481	Office	ICF/I&DP/NAI
482	Office	ISAM/ME/EE/USEC/LD/NAI
490	Demonstration Facility	ISAM/OPS
491	Refurb Facility	ISAM
492	Dye Pump Facility	ISAM
493	Separator Support Facility	ISAM
494	Laser Assembly	ISAM
531	Test Stand	I&DP
865	Advanced Test Accelerator	OPS
F27 Hangar	Aircraft Hangar	I&DP
1601	ME Techs	ICF/NAI
1602	Electronics Fab.	ICF/EE

**Appendix A (Cont'd.)
Laser Programs Facilities**

Building Number	Facility Name	Program Occupants
1678	ICF Offices	ICF/NAI
1725	EE Tech. Support	ICF
1727	Tech. Support	AMP
1736	Tech. Support	ISAM/NAI
1738	Technology	OPS
2775	Offices	AMP
2801	Student Lab	DAS
2802	Lab	DAS
2804	Office	AMP
2825	Office	OPS
3724	Y Division Offices	OPS/ICF
3725	Y Division Offices	ICF/OPS/I&OP
3726	Office	ICF
3751	Hazards Control/Y Div.	HC ES&H Team
3777	Y Div. Offices	DOE
3903	Glass Depot	ICF
3904	E Tech. Support	ICF
3905	Test Lab/Draft	ICF
3906	Tech Support	ICF
3907	E Tech Support	ICF
3925	Y Div. Conference Room	ICF/OPS
3926	Y Div. Offices	ICF
3981	Y Div. Offices	ICF
3982	Y Div. Offices	ICF
5925	Tech Support	ISAM
5926	Tech Support	HR
5976	Computer Support	ISAM
5977	Offices	ISAM
5978	Offices	ISAM
5981	Offices	ISAM
5982	Offices	ISAM
5983	Offices	ISAM
5984	Offices	ISAM
5985	Offices	ISAM
4297	Tent	I&DP
4299	Tent	OPS
5399	Tent	I&DP